

ABSTRACT OF THE DISCLOSURE

The present invention provides an optical switch including a loss element having a signal loss, and a rare earth doped gain element optically connected in series with the loss element. The rare earth doped gain element is operable to produce a signal gain. The signal gain and the signal loss are about equal. The present invention also provides a method of optical switching including optically connecting a loss element in series with a rare earth doped gain element and passing an optical signal through the loss element and the gain element. The loss element attenuates the optical signal by a first amount. The method further includes selectively applying an optical pump to the gain element to perform the switching, the gain element amplifying the optical signal by the first amount in response to the optical pump.